CLIMATE RESILIENT FOOD SYSTEMS IN ETHIOPIA

A CASE STUDY DEVELOPED BY THE CLIMATE RESILIENT FOOD SYSTEMS (CRFS) ALLIANCE

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UNFSS country case studies: Ethiopia Desk review

- Entry points for the CRFS Alliance
- Gaps for implementation
- Monitoring and enforcement mechanisms
- National circumstances
- Food systems overview
- Risk analysis
- Climate, agriculture and food systems policies
- Institutional arrangements and coordination

- Synthesis of climate and food systems priorities
- Implementation strategy
- Synergies and trade-offs
- Needs for implementation
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- Climate risk and vulnerability overview
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Introduction

- Ethiopia is a landlocked country in the Horn of Africa, bordering Eritrea to the north, Djibouti and Somalia to the east, South Sudan, and Sudan to the west, and Kenya to the south.
- The country is vast, covering a territory of 1.1 million km², which creates challenges for territorial governance.
- Ethiopia has three rainfall seasons: Bega, Belg, and Kiremt.
- Based on the climate change profile of Ethiopia, under a high emissions scenario, the country is projected to face increasing average temperatures of 1.8 °C by 2050, and 3.5 °C by 2100.
- In 2020, Ethiopia was the 59th strongest economy in the world in terms of GDP, 127th in total exports, 92nd in total imports, and 173rd economy in terms of GDP per capita.
- The smallholder farming system accounts for about 90% of the cropland area in the country, and is the backbone of the economy and people's livelihoods.
- This farming system is mostly reliant on rain-fed agriculture, and as such it is extremely vulnerable to climate variability and climate change.
Food Systems: snapshot

Ethiopia has made significant strides in developing their food systems – evolved from traditional to transitional.

**PRODUCTION**
- About 12 M smallholder farmers produce c. 95% of all agricultural production.
- Only 11.7 M ha of land is currently cultivated – cereals dominating 70% of the agriculture variety.
- Key crops produced by Ethiopia:
  - Cereals
  - Pulses and oil seeds
  - Dairy
  - Coffee
  - Sugarcane, potatoes
  - Other spices and herbs
- Although the country has been producing a rich variety of crops, food security is an issue as the agriculture sector remains fragile and vulnerable to climate change.

**DISTRIBUTION**
- More reliance on markets by consumers and better integrated markets.
- Greater development of commercial food markets and modern food distribution and retail infrastructure.
- Emergence of modern marketing methods, technologies and systems, reflected in the increase use of mobile phones.
- Average farmer incomes have risen significantly.

**CONSUMPTION**
- Dietary transformation with higher consumption levels.
- The total annual food consumption in Ethiopia has increased from 288 kg per year in 1996 to 447 kg in 2018.
- Starchy staples that are the cheapest source of energy contribute the highest share of the energy intake.
- Greater consumption of processed and convenience foods, including meat and wheat-derived products, and eating outside of the home more often.
- Lack of diversity in diets and underconsumption of nutrient-rich fruits and vegetables have contributed to high levels of malnutrition.
## Food Systems: challenges

<table>
<thead>
<tr>
<th>AT 1: ensure access to safe and nutritious food for all</th>
<th>AT 2: shift to sustainable consumption patterns</th>
<th>AT 3: boost Nature positive production</th>
<th>AT 4: Advance equitable livelihoods</th>
<th>AT 5: Build resilience to shocks &amp; stress</th>
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<tbody>
<tr>
<td>1.1 Low availability &amp; affordability of nutrient-dense foods</td>
<td>2.1 Low dietary diversity, especially among infants, children &amp; mothers</td>
<td>3.1 Lack of access to agricultural inputs and technologies</td>
<td>4.1 Weak market linkages</td>
<td>5.1 Limited climate adaptation and resilience</td>
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<tr>
<td>1.2 Lack of food safety management infrastructure</td>
<td>2.2 Shift towards unhealthy diets, especially in urban areas</td>
<td>3.2 Lack of access to agricultural and rural financial services</td>
<td>4.2 Limited value addition and processing capacity</td>
<td>5.2 Need for integrated risk and crisis management</td>
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<tr>
<td>1.3 Lack of food fortification, processing and packaging</td>
<td>2.3 Limited dietary guidelines and education</td>
<td>3.3 Soil depletion</td>
<td>4.3 High post-harvest losses</td>
<td>5.3 Need for universal food access, especially in vulnerable areas</td>
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<td>3.4 Lack of adoption of agro-ecological practices</td>
<td>4.4 Weak institutional support</td>
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<td>3.5 Weak land ownership management infrastructure</td>
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Risk analysis: climate change

OVERALL RISK AND VULNERABILITY

• Ethiopia is highly vulnerable to climate change -- the main climate-induced risks include drought and high temperature extremes.

• Highly variable climate, with average annual temperatures varying from 10 °C in the highlands to about 35 °C in the lowlands.

• The diverse agro-ecological zones in Ethiopia pose different levels of sensitivities to climate change impacts. Drought is one of the major climate hazard in Ethiopia, with significant impacts on agricultural productivity and related impacts on incomes, food security, and nutrition.

• Environmental problems like soil erosion, forest fires, deforestation, recurrent droughts, desertification, land degradation, pests and diseases and loss of biodiversity and wildlife have also severely impacted the country.

RISK AND VULNERABILITY RELATED TO FOOD & AG

CLIMATE RISKS

• Frequent drought & occasional floods
• Seasonal shift in rainfall and temperature regime
• Extreme events including heatwaves and storms

POTENTIAL IMPACTS

• Shortening of crop plant maturity period
• Expanding crop diseases
• Low productivity of soil and animals
• Increase in crop failures
• Decrease in livestock feed availability and quality
• Reduced animal health, growth and reproduction
• Increase in distribution of infectious diseases
• Increase in decomposition rate of organic matter
• Contracting of pastoral zones across the country
• Increase in livestock death
Agriculture & Food Systems: policies

- Agriculture has been fundamental in Ethiopian government’s development strategy and is seen as a major driver for industrialisation.
- A notable pillar strategy that Ethiopia has been prioritising has been to end over-reliance on rain-fed agriculture by expanding the country’s irrigation system capacities and encouraging irrigation investments.

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<tr>
<th>POLICY</th>
<th>YEAR</th>
<th>OBJECTIVES/ STRATEGY</th>
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<tbody>
<tr>
<td>Ethiopia National Adaptation Plan (NAP-ETH)</td>
<td>2019</td>
<td>To help in building adaptive capacity and resilience, and strengthening holistic integration of climate change adaptation in Ethiopia’s long-term development pathway.</td>
</tr>
<tr>
<td>Ethiopian 10-Year Perspective Development Plan</td>
<td>2021-2030</td>
<td>End reliance on rain-fed agriculture by developing and increasing irrigation capacity, as well as expanding agricultural investments.</td>
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<tr>
<td>Climate Resilience Green Economy (CRGE)</td>
<td>2011-2025</td>
<td>Build the economy to middle-income status by 2025 by achieving green or low emissions economic growth that is resilient.</td>
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<tr>
<td>Growth and Transformation Plan II (GTP II)</td>
<td>2016-2020</td>
<td>Transitioning agriculture to be more market-oriented to aid and align the agriculture sector development plan with the green economy development strategy.</td>
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<tr>
<td>National Policy and Strategy on Disaster Risk Management</td>
<td>2013</td>
<td>Reduce potential damage and disaster risk through a coordinated and comprehensive DRM system in the context of sustainable development.</td>
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<tr>
<td>Food Systems National Pathway</td>
<td>2021</td>
<td>Aim for holistic transformation of the country’s food systems from production to consumption that promotes enhanced food safety, nutrition and diets, improved livelihoods, greater land preservation and restoration and greater resilience to shocks and stress.</td>
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Agriculture & Food Systems: Institutional arrangement

- In the agricultural sector, two primary regime institutions remain fundamental in shaping the overall agricultural development at the national level – the Ministry of Agriculture and Natural Resources (MoANR) and Agricultural Transformation Agency (ATA).

- MoANR is responsible for overall policy development and implementation, and ATA is mandated to take a strategic and holistic perspective on how to transform the agricultural sector.

- MoANR is divided into two directorates, i) on agricultural production, and ii) on natural resource management.

- National and regional agricultural research institutes also play a major role in developing agricultural campaigns and policies.
Other stakeholders in food systems

- Farmers
- Investors
- Technologists / Innovators
- Ministry of Agriculture and its affiliates

- Private sector
- Technologists / innovators
- Ministry of Agriculture and its affiliates
- Agro-industrial parks
- Ministry of Trade and Industry
- Ministry of Health and its affiliates

- Private sector
- Technologists / innovators
- Ministry of Trade and Industry
- Ministry of Transport

- General public
- Private sector
- Regulatory and standard institutions
- Ministry of Agriculture and its affiliates
- Ministry of Health and its affiliates
- NDRMC and its affiliates
Climate resilient food systems: approach

Strategies focus primarily on efforts to enhance the adoption of climate-smart agriculture (CSA) in agricultural production - climate risk management and DRR (climate information), water management and nexus approach, soil health and fertility, and climate smart technologies.

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<tr>
<th>THEME</th>
<th>APPROACH</th>
<th>BENEFITS</th>
<th>LIMITATIONS</th>
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</table>
| Climate risk management and DRR            | Early warning systems, e.g., improved weather information, pest and disease monitoring | • Increased farmers’ preparedness  
• Reduced farmer yield losses  
• Improved income                  | • Expensive to resource-poor farmers  
• Lack of long-term early warning systems |
| Water management, irrigation, nexus        | Efficient water utilisation, *in-situ* water harvesting and conservation, irrigation systems | • Improved yields, income  
• Reduced water runoff and topsoil erosion  
• Increased water productivity | • Open structures prone to dryness  
• Expensive to poor farmers |
| Agricultural, soil and land practices      | Crop residue management, contour farming, agroforestry                   | • Reduce emission from nitrous oxides and methane  
• Improved soil productivity       | • Large amount of nutrients required  
• Alternate host to pests and invasive species |
| Climate-smart technologies                 | Crop diversification, efficient fertiliser application, reduced tillage, crop rotation, new crop varieties | • Reduced emissions  
• Ensured yields  
• Alternate livelihood income  
• Carbon sequestration | • Limited to larger areas  
• High farm input requirement  
• Pest control difficulties  

Climate resilient food systems: projects

**Climate risk management and DRR**
- NextGen Agricultural Drought Monitoring and Warning System (NADMWS)
- Agro-Met
- Weather Impact’s CommonSense
- Partners for Resilience
- Scaling-up drought anticipatory actions (AAs) for food security in Africa
- Index-based livestock insurance (IBLI)
- Nexus Gains
- Satellite Index Insurance for Pastoralists of Ethiopia (SIIPE)

**Water management, irrigation, nexus**
- Participatory Small-scale Irrigation Development Programme II
- Integrated Shallow Groundwater Irrigation Development

**Agricultural, soil and land practices**
- Integrated Landscape Management to Enhance Food Security and Ecosystem Resilience
- ETHIOSIS
- SLM II Programme

**Climate-smart technologies**
- Food Systems Resilience Program (FSRP)
- Scaling up Climate Ambition on Land Use and Agriculture through NDCs and NAPs (SCALA)
- R4 Rural Resilience Initiative
- Africa Climate security observatory
- Farm Africa’s Market Approaches to Resilience
- Excellence in Agronomy Initiative
- Ukama Ustawi - Diversification for Resilient Agrifood Systems
**Climate resilient food systems: priorities in NAP and implementation strategies**

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<th><strong>PRIORITY</strong></th>
<th><strong>IMPLEMENTATION STRATEGY</strong></th>
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<tr>
<td>Enhancing food security through improving agricultural productivity in a climate smart manner</td>
<td>Ensure that climate change adaptation is proactively mainstreamed in the agriculture sector, including programs and projects, agriculture productivity is increased, diversity is enhanced, climate-smart agricultural practices are adopted by smallholders and HH are food secure.</td>
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<tr>
<td>Strengthening sustainable natural resources management through safeguarding landscapes and watersheds</td>
<td>Ensure natural resource management is prioritised in vulnerable landscapes and resilience of rangelands and watersheds are increased.</td>
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<td>Improving soil water harvesting and water retention mechanisms</td>
<td>Ensure increased use of rainwater harvesting methods, increased implementation of soil and water conservation. Investment in irrigation continues to be GoE’s priority after the 2018 political reform with greater emphasis on infrastructure, including water and irrigation schemes.</td>
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<tr>
<td>Enhancing sustainable forest management</td>
<td>Ensure increased awareness of climate change impacts on forests, forest management and governance systems, afforestation, reforestation and conservation of natural forests.</td>
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<tr>
<td>Strengthening drought, livestock and crop insurance mechanisms</td>
<td>Ensure farmers and herders are insured against climate risks through enabling financial mechanisms to accommodate drought. Ensure insurance agencies are capacitated to provide drought and crop insurance.</td>
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<td>Improving early warning systems</td>
<td>Improve early warning prediction and communication through strong collaboration and integration between data providers and implementers. Ensure that vulnerable people have access to early warnings for climate hazards with proper communication mechanisms.</td>
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## Climate resilient food systems: priorities in food systems pathway

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<tr>
<th>Priority</th>
<th>Implementation Strategy</th>
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| 1. Nutrient-dense food production; food safety, fortification and rural electrification and appropriate climate smart technologies | Strengthen the national food safety management and regulation system of Ethiopia by assessing and upgrading the national food control system in collaboration with relevant stakeholders and focusing on selected value chains/sectors  
Support diversified food production to increase the supply of nutrient-dense foods  
Promote and enhance the production and consumption of fortified nutrient-dense staple foods through using industrial food fortification and biofortification and public and private partnership initiatives  
Rural electrification to promote environmentally friendly and climate resilient technologies* |
| 2. Supply and value chain development, national food based dietary guidelines and nutrition literacy and awareness creation | Improve young children’s, adolescents’ and mothers’ nutrition and dietary diversity through a systematic analysis and a systems approach  
Strengthen climate smart livestock value chains  
Promote innovations, government commitment and local ownership  
Strengthen innovative strategies and private sector engagement mechanisms for supply chain management and handling systems  
Sustained awareness creation and food and nutrition literacy to change consumer’s behavior on the consumption of nutrient-dense and safe food through women empowerment and leadership in food systems  
National food based Dietary Guidelines to provide dietary recommendations for the Ethiopian population two years and older for increased diet quality |
| 3. Integrated policy-making, land reform, and improved government finance provision for agricultural and rural transformation | Implement land reform and land administration that will ensure the right to lease, and use it for collateral to facilitate land consolidation, adoption of innovation, and reduce environmental degradation*  
Introduce land use planning including resource planning, integrated landscape & watershed management*  
Establish finance system for farmers to access credit, get insurance services and offer farmers financial literacy to help enhance rural and agricultural investment, and support primary investment on farms* |
## Climate resilient food systems: priorities in food systems pathway

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| 4. Agricultural technologies, innovation and agricultural input supplies | Selection and timely supply of agricultural inputs and technologies to boost production and productivity*  
Advanced forecasting system for variables affecting agriculture-based activities on fine spatiotemporal weather models in Ethiopia |
| 5. Access to markets, market information, infrastructure and specialisation | Upgrade and strengthen national market information systems and related digital approaches for mapping to strengthen evidence-based agricultural development planning  
Promote and facilitate the implementation of the agricultural commercialisation through creating production-specific specialization corridors for nutrient-dense commodities |
| 6. Managing and mainstreaming risk and protecting the poor | Modernise and upscale indigenous food production and processing for the general population  
Formalise and integrate disaster risk management including index-based crop and livestock insurance*  
Inclusive and sustainable social protection transfer including the use of digital fresh food vouchers among PSNP household  
Strengthen system for timely and effective shock response including the prevention and treatment of wasting and micronutrient deficiencies |

**Note:** The food systems pathway strategies highlighted in blue* have been prioritised by the government of Ethiopia as requiring exceptionally strong political commitment.
Needs and Gaps for implementation: gaps in climate resilient food systems

- Building food systems resilience is largely focused on agriculture.
- Rainfed agriculture dominates the agriculture sector.
- Climate data collection gaps due to geographically sparse and poorly maintained air stations.
- Limited access to improve agricultural knowledge, information, innovation and technologies.
- Untapped potential of crop diversification. The recurrent exposure to drought shocks have hindered abilities of farmers to diversify crop portfolios.
- The NDC, NAP and other policies and plans currently have little to no consideration towards food systems.
- Weak linkages with stakeholders like farmers, local institutions, research institutes, others for agricultural knowledge and information system.
- Low implementation capacity of institutions, lax system of project administration, monitoring and evaluation.
- Measuring food systems emissions, developing carbon accounting throughout the whole food system is missing in Ethiopia’s food systems policies and plans.
- Lack of harmonisation in coordination mechanisms.
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<tr>
<th>CAPACITIES NEEDED</th>
<th>INTERVENTIONS REQUIRED</th>
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</table>
| 1. Capacity to build and maintain data archives/database on impacts of climate change for agro-climatic zones, vulnerable groups and ecosystems. | • Institutionalise the climate change impact database by involving designated data collectors, e.g., the Central Statistics Agency (CSA) and planning bureaus.  
• Devise Knowledge Management System and institutional memory mechanism for adaptation. |
| 2. Capacity to run climate models, providing predictions and scenarios, including validation with reference to on-the-ground historical data and level of assessing certainty - at national and regional scales. | • Build the capacity of Ethiopia's National Meteorology Agency (NMA) to produce precise and reliable information.  
• Collect and compile ground data that can augment modeling and scenario building. |
| 3. Capacity to assess status of vulnerability and determine required adaptation responses for the major development sectors and for all agro-climatic zones, vulnerable groups and ecosystems. | • Coordinate vulnerability analysis of sectors and regions, including agro-climatic zones, vulnerable groups and ecosystems.  
• Compile existing vulnerability data/information collected by sectors, regions and non-state actors. |
| 4. Capacity for enhanced mobilisation and involvement of non-state actors including professional societies, development partners and donors. | • Create strong partnership/network among non-state actors and others.  
• Involve professionals and civil society actors in adaptation planning, implementation and monitoring. |
Entry points for the CRFS Alliance

- Coordinating and mobilising existing methods, solutions and expertise in aligning action towards priority solutions by combining the collective resources and technical expertise of the alliance members.

- Collection of possible climate finance sources and guidance on applying to them.

- Create coherence in the NAP priorities outlined for climate resilient food and agriculture with the priorities outlined in Ethiopia’s national pathway on food systems.

- Alignment of interventions and solutions with countries’ needs and priorities through – inter alia - dedicated surveys to be issued to countries which have formally expressed an interest in the work of Alliance to outline areas where support is needed.

- Generating evidence and learnings from what is working well and what is not.

- Strengthened integration between organisations and stakeholders on the ground to improve peer-to-peer exchanges on climate resilient food systems intervention leapfrogging progress.

- Strengthen the coordination among national stakeholders and regional counterparts to ensure better implementation, monitoring and evaluation of actions.